BIRCH, STEWART, KOLASCH & BIRCH, LLP

INTELLECTUAL PROPERTY LAW
8110 GATEHOUSE ROAD
SUITE 500 EAST
FALLS CHURCH, VA 22042-1210
U S A
(703) 205-8000

FAX (703) 205-8050
(703) 698-8590 (G IV)

e-mail. mailroom@bskb.com
web· http://www.bskb.com

CALIFORNIA OFFICE·
COSTA MESA, CALIFORNIA

TERRELL C BIRCH
RAYMOND C STEWART
JOSEPH A KOLASCH
JAMES M SLATTERY
[illegible] L SWEENEY*
MICHAEL K MUTTER
[illegible] GORENSTEIN
[illegible] M MURPHY, JR
[illegible] R SVENSSON
[illegible] L CLARK
[illegible] D MEIKLE
[illegible] S WEINER
[illegible] MCKINNEY MUNCY
[illegible] J KENNEY
[illegible] J DALEY
[illegible] W BAILEY
[illegible] A CASTELLANO, III
[illegible] D YACURA

OF COUNSEL
HERBERT M BIRCH (1905-1996)
ELLIOT A GOLDBERG*
WILLIAM L GATES*
EDWARD H VALANCE
RUPERT J BRADY (RET)*
F PRINCE BUTLER
FRED S WHISENHUNT

*ADMITTED TO A BAR OTHER THAN VA

THOMAS S AUCHTERLONIE
JAMES T ELLER, JR
SCOTT L LOWE
MARK J NUELL, Ph D
D RICHARD ANDERSON
PAUL C LEWIS
MARK W MILSTEAD*
JOHN CAMPA*
RICHARD J GALLAGHER

REG PATENT AGENTS
FREDERICK R HANDREN
MARYANNE ARMSTRONG, Ph D
MAKI HATSUMI
MIKE S RYU
CRAIG A McROBBIE
GARTH M DAHLEN, Ph D
LAURA C LUTZ
ROBERT E GOOZNER, Ph D
HYUNG N SOHN
MATTHEW J LATTIG
ALAN PEDERSEN-GILES
JUSTIN D KARJALA
C KEITH MONTGOMERY
TIMOTHY R WYCKOFF
HERMES M SOYEZ, Ph D
KRISTI L RUPERT, Ph D

Date: June 13, 2000
Docket No.: 3542-0104P

Assistant Commissioner for Patents
Box PATENT APPLICATION
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of

Inventor(s): WATANABE, Keita

For: SOUND GENERATOR FOR A PORTABLE DEVICE

Enclosed are:

_X_ A specification consisting of 8 pages

_X_ 05 sheet(s) of Formal ___ drawings

_X_ An assignment of the invention

___ Certified copy of Priority Document(s)

_X_ Executed Declaration _X_ Original ___ Photocopy

___ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27

___ Preliminary Amendment

___ Information Disclosure Statement, PTO-1449 and reference(s)

___ Other _____

The filing fee has been calculated as shown below:

			LARGE ENTITY			SMALL ENTITY	
FOR	NO. FILED	NO. EXTRA	RATE	FEE		RATE	FEE
BASIC FEE	********** ********** **********	********** ********** **********	***** ***** *****	$690.00	or	**** **** ****	$345.00
TOTAL CLAIMS	10 - 20 =	0	x18 =$	0.00	or	x 9 = $	0.00
INDEPENDENT	1 - 3 =	0	x78 =$	0.00	or	x 39 = $	0.00
MULTIPLE DEPENDENT CLAIM PRESENTED no			+260 = $	0.00	or	+130 = $	0.00
			TOTAL $	690.00		TOTAL $	0.00

_X_ A check in the amount of $ 730.00 to cover the filing fee and recording fee (if applicable) is enclosed.

___ Please charge Deposit Account No. 02-2448 in the amount of $_____. A triplicate copy of this transmittal form is enclosed.

___ No fee is enclosed.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. 1.16 or under 37 C.F.R. 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By _____
JAMES M. SLATTERY
Reg. No. 28,380
P. O. Box 747
Falls Church, Virginia 22040-0747

(703) 205-8000
JMS/cqc

TITLE OF THE INVENTION

SOUND GENERATOR FOR A PORTABLE DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to a buzzer for a portable communication device such as a portable telephone and a beeper.

The portable communication device is operated by the power of a storage battery as a main source of electricity having a large capacity under normal conditions. In such a device, it is necessary to provide a backup source for preventing a memory from erasing data such as telephone numbers stored therein, if the voltage of the main source, or the main source is cut off. In addition, it is necessary to provide an auxiliary source to operate a buzzer even if the main source is cut off.

As an auxiliary source, a disk type small battery is used. On the other hand, as a sound source for calling sound and a warning sound of the portable communication device, a very small buzzer is used.

In general, the auxiliary battery is mounted on a source portion of a substrate, and the buzzer is attached to a position necessary for the portable communication device, which positions have no relation with each other.

Referring to Fig. 7 showing a prior art, a buzzer 21 is disposed on a substrate (not shown) regardless of a battery 22. The battery 22 is set in an insulation case 23 mounted on the substrate. The battery is connected to a control

circuit for a memory and the buzzer through contact plates 24 and 25 connected to a circuit on the substrate. The battery is a storage battery charged at the same time as the charging of the main battery, and provided as a backup battery or a source for the buzzer.

In the prior art, since the battery and the buzzer are independently disposed, it is necessary to form a space on the substrate for mounting the battery, resulting in increasing of the size of the substrate and hence the size of the portable communication device.

Furthermore, the buzzer 21 and the case 23 for the battery 22 are manufactured in separate manufacturing processes, which causes the manufacturing and assembling costs to increase.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a sound generator having a battery which may be decreased in size and manufactured at a low cost.

According to the present invention, there is provided a sound generator for a portable device comprising, a case, a sound generating device mounted on the case, a battery mounted in the case, terminals provided on the case, a pair of leads connecting a pair of electrodes of the battery with the terminals.

The case has a recess on an outside wall thereof, and the sound generating device is mounted in the recess.

Each of the leads comprises a resilient contact plate contacted with the corresponding electrode.

The sound generating device may be a buzzer.

The battery has an upper electrode and lower electrode.

The terminals comprise a pair of terminals for applying a voltage of the battery to a control circuit, and a pair of terminals for applying a voltage from the control circuit to the buzzer for operating it.

The battery is held by the contact plate engaged with the upper electrodes.

The contact plate holding the battery is offset.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a plan view of a sound generator according to the present invention;

Fig. 2 is a sectional side view of the sound generator;

Fig. 3 shows the underside of the sound generator;

Fig. 4 is a perspective view;

Fig. 5 is an explode perspective view;

Figs. 6 is perspective view showing a modification of terminals; and

Figs. 7 is a perspective view of a conventional sound generator.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figs. 1 and 2, a sound generator 1 according to the present invention comprises a case 2 made of plastic, a buzzer 3 mounted in the case 2, and a disc type

small battery 8 attached on the case 2. The buzzer 3 as a sound generating device comprises a coil 4, a core 5 and an armature 7. An electronic current is supplied to the coil from a control circuit (not shown) to generate a buzzing sound.

On the case 2, a circular recess 9 is formed as shown in Fig. 4. The small battery 8 has a positive electrode on the upper side thereof and a negative electrode on the underside thereof. Resilient metallic contact plates 10 and 11 are negative electrode. The battery 8 is resiliently held by the elasticity of the contact plate 10. In order to facilitate to detach the battery 8 from the case 2, the contact plate 10 is offset as shown in Fig. 4.

As shown in Fig 3, the contact plates 10 and 11 are extended to the underside of the case 2 and bent on the underside. On the underside of the case 2, four connecting terminals 12, 13, 14, and 15 are attached at four corners. Each of the terminals 12 through 15 comprises a flat metal plate. The contact plates 10 and 11 are connected to two terminals 12 and 13.

More particularly, each of bent portions 10a and 11a of the contact plates 10 and 11 are engaged with a groove 19 formed in the underside of the case 2 as shown in Figs. 4 and 5. Each of the terminals 12 and 13 is upwardly bent in an inverted L-shape to form a connecting end 12a as shown in Fig. 5. The bent portion 10a (11a) is connected with the connecting end 12a by welding. Thus, the contact plates 10 and 11 are electrically connected with the terminals 12 and 13. The terminals 14 and 15 are connected to the coil 4.

Furthermore, the case 2 has a sound discharge hole 16.

The sound generator 1 is mounted on a printed circuit (not shown). The terminals 12, 13, 14 and 15 are connected to corresponding terminals of the control circuit, thereby applying a voltage to the control circuit from the battery 8 through the contact plates 10 and 11 and terminals 12 and 13. A control signal is applied to the buzzer 3 from the control circuit through the terminals 14 and 15, so that a buzzing sound emanates from the sound discharge hole 16.

Although the contact plates 10 and 11 and the terminals 12 and 13 are separately made, each couple the contact plate 10 and terminal 12, and contact plate 11 and terminal 13 may be made by a single plate.

Fig. 6 is a perspective view showing a modification of the device. Lead wires 17 and 18 are vertically connected to the terminals 12 through 15. The wires are inserted in corresponding holes formed in a circuit board and bent on the underside of the circuit board, thereby connecting each terminal with a corresponding terminal of the circuit.

In accordance with the present invention, the battery is attached to the case of the sound generation. Therefore, the battery and the sound generator can be assembled in a small size. Since it is not necessary to manufacture a housing for mounting the battery, the manufacturing cost is reduced.

What is claimed is

1. A sound generator for a portable device comprising;

a case;

a sound generating device mounted in the case;

a battery mounted on the case;

terminals provides on the case;

a pair of leads connecting a pair of electrodes of the battery with the terminals.

2. The sound generator according to claim 1 wherein the case has a recess on an outside wall thereof, and the sound generating device is mounted in the recess.

3. The sound generator according to claim 1 wherein each of the leads comprises a contact plate contacted with the corresponding electrode.

4. The sound generator according to claim 1 wherein the sound generating device is a buzzer.

5. The sound generator according to claim 3 wherein the battery is a disc type battery, and has an upper electrode and lower electrode.

6. The sound generator according to claim 4 wherein the terminals comprises a pair of terminals for applying a voltage of the battery to a control circuit,and a pair of terminals for applying a voltage from the control circuit to the buzzer for operating it.

7. The sound generator according to claim 5 wherein the contact plate contacted with the upper electrode is made of a resilient metal plate.

8. The sound generator according to claim 7 wherein the battery is held by the contact plate engaged with the upper electrode.

9. The sound generator according to claim 8 wherein the contact plate holding the battery is offset.

10. The sound generator according to claim 8 wherein each of the terminals comprises a flat metal plate so as to be mounted on a printed circuit substrate.

SOUND GENARATOR FOR A PORTABLE DIVICE

Abstract of the Disclosure

A sound generating device is mounted in a recess formed in a case, and a battery is mounted on the case. A pair of terminals are provided on the underside of the case. A pair of leads connect a pair of electrodes of the battery with the terminals.

FIG. 1

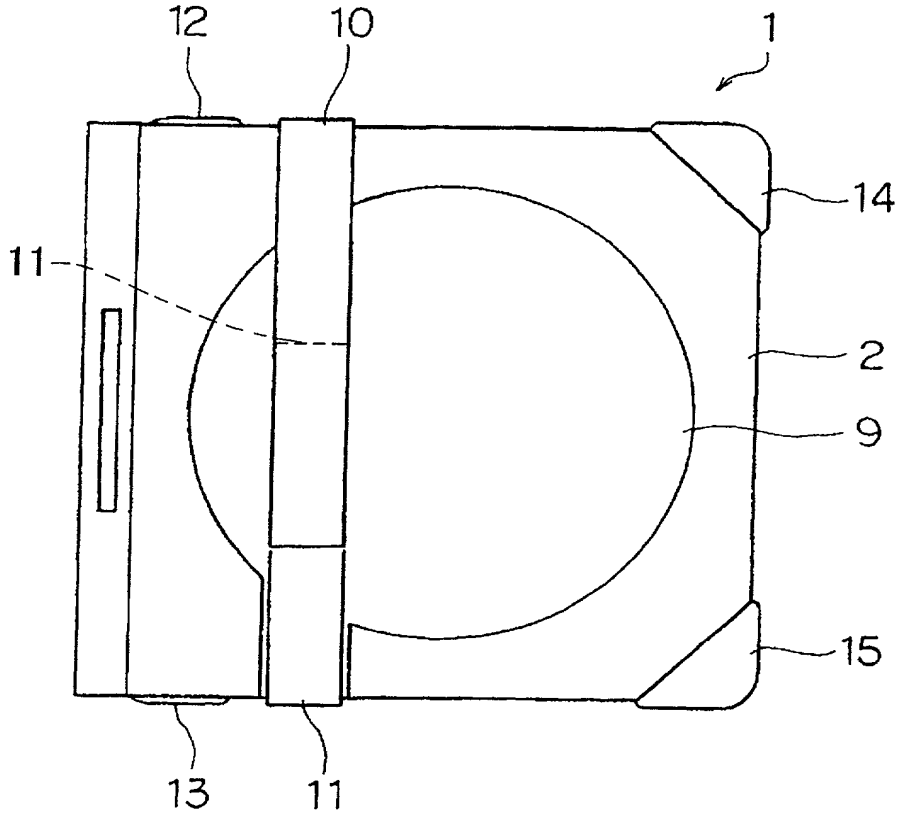


FIG. 2

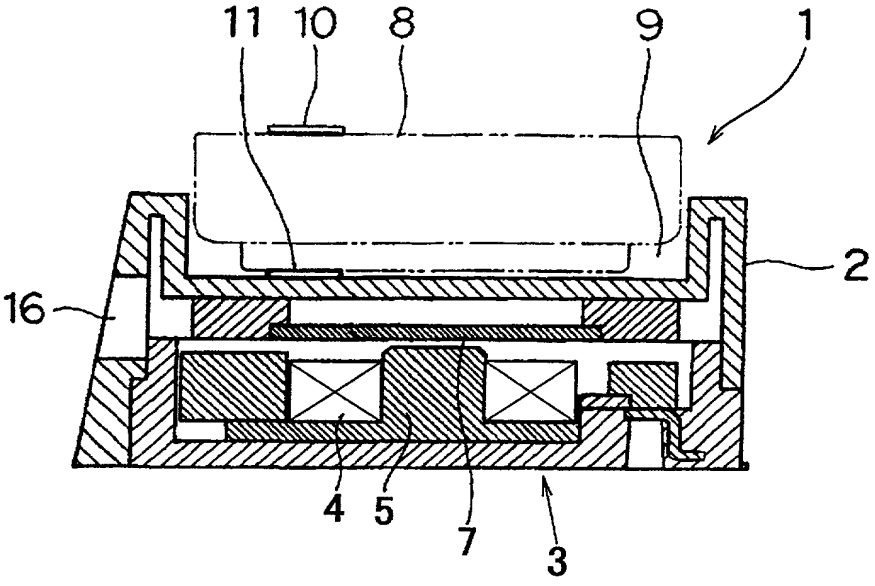


FIG. 3

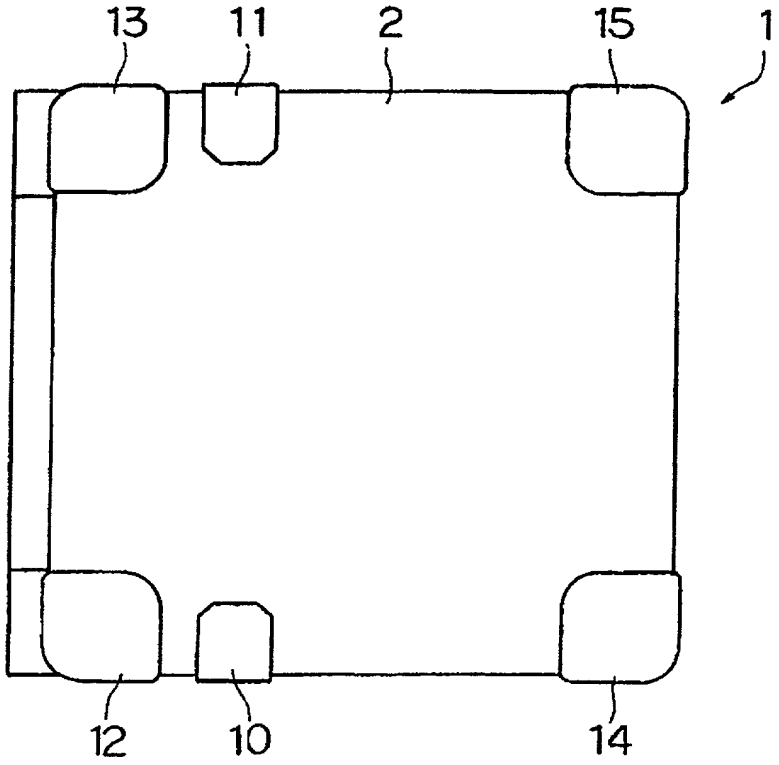


FIG. 4

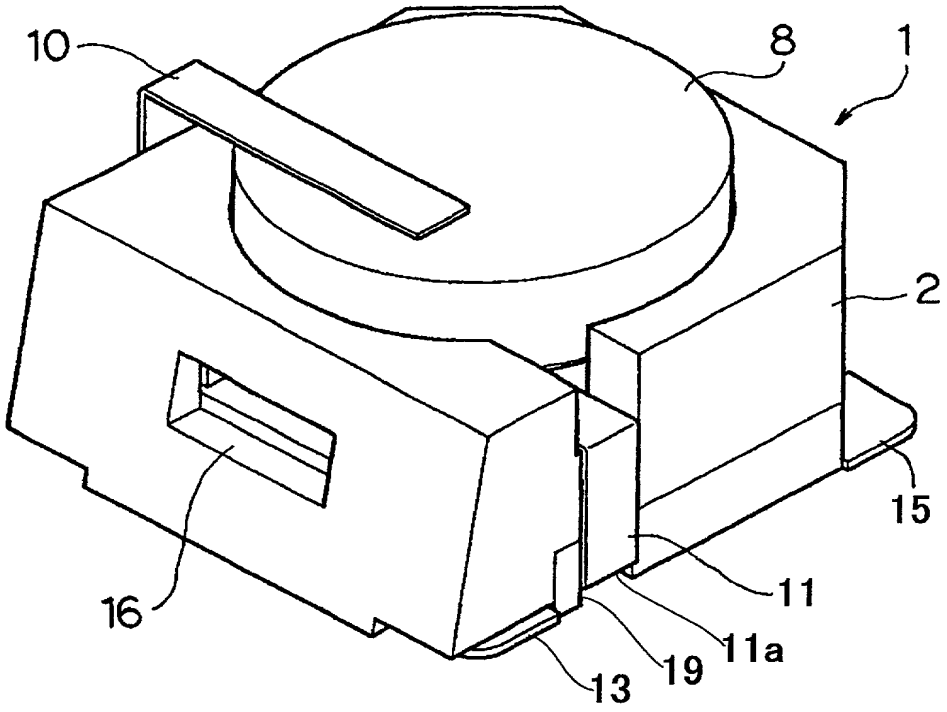


FIG. 5

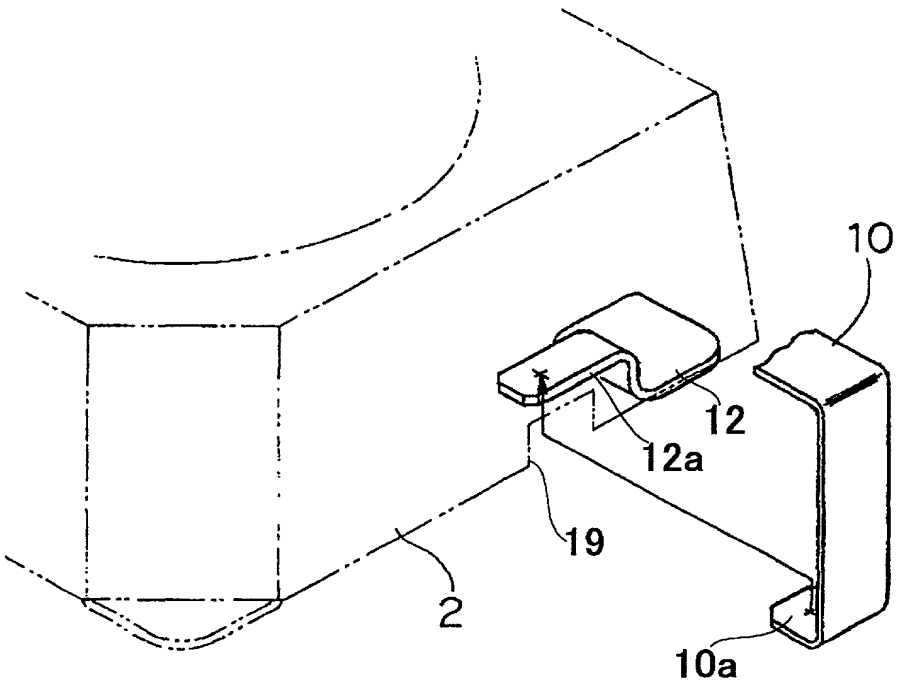


FIG. 6

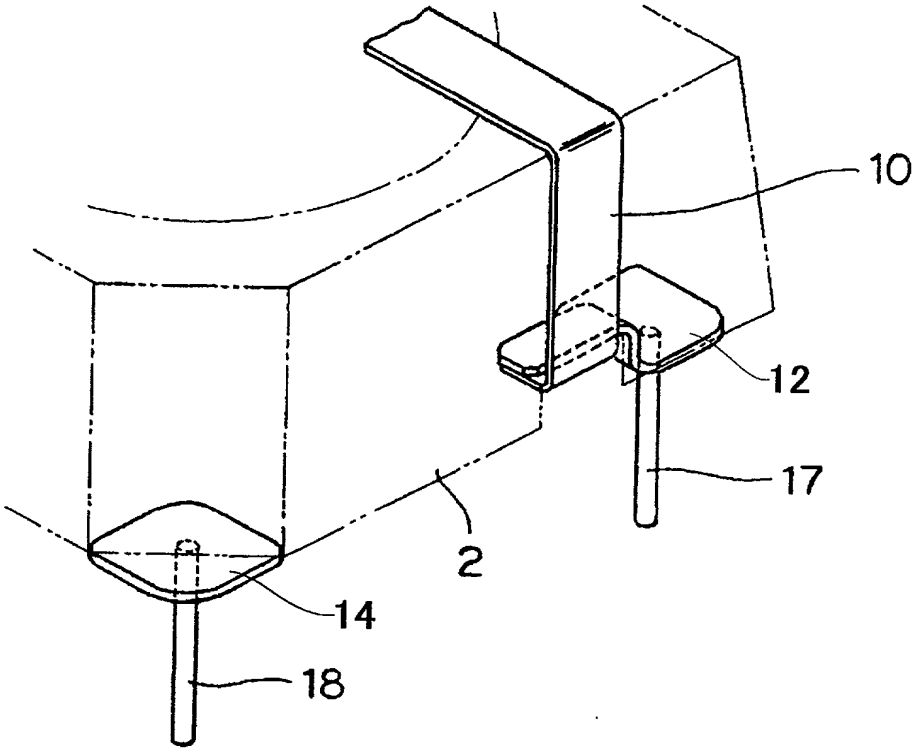
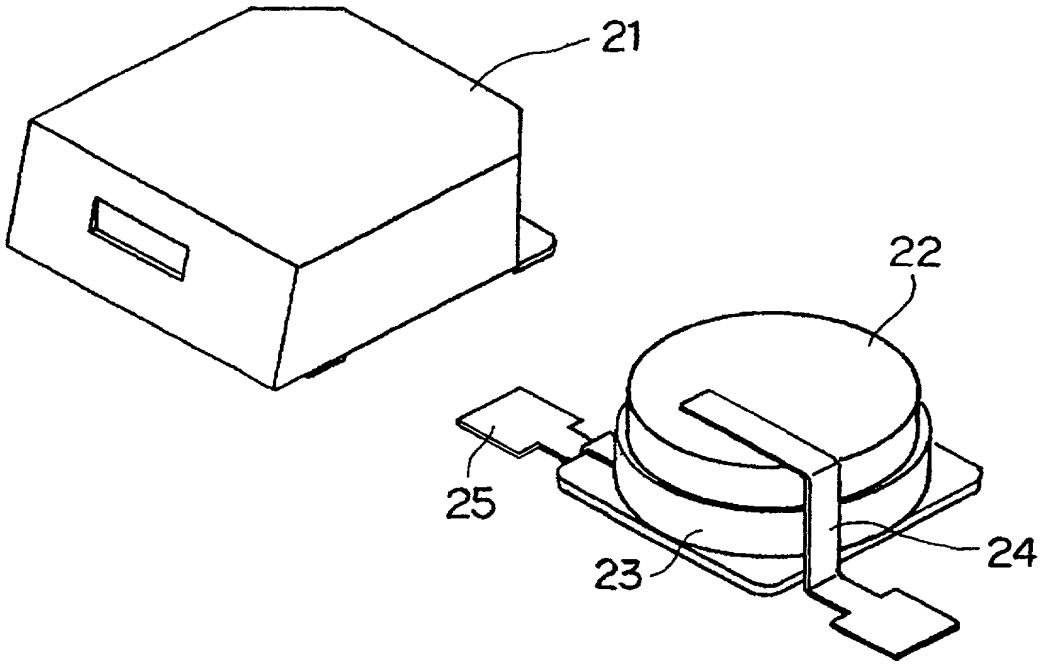


FIG. 7

PRIOR ART



3542-104P

Attorney Docket No.

BIRCH, STEWART, KOLASCH & BIRCH, LLP

P.O. Box 747 • Falls Church, Virginia 22040-0747
Telephone: (703) 205-8000 • Facsimile: (703) 205-8050

PLEASE NOTE: YOU MUST COMPLETE THE FOLLOWING

COMBINED DECLARATION AND POWER OF ATTORNEY FOR PATENT AND DESIGN APPLICATIONS

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated next to my name; that I verily believe that I am the original, first and sole inventor (if only one inventor is named below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Insert Title: SOUND GENERATOR FOR A PORTABLE DEVICE

Fill in Appropriate Information - For Use Without Specification Attached:

the specification of which is attached hereto. If not attached hereto,
the specification was filed on _____ as
United States Application Number _____;
and amended on _____ (if applicable) and/or
the specification was filed on _____ as PCT
International Application Number _____; and was
amended under PCT Article 19 on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representative or assigns more than twelve months (six months for designs) prior to this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Insert Priority Information: (if appropriate)

Prior Foreign Application(s)			Priority Claimed	
No. 11-168952 (Number)	JAPAN (Country)	June 15, 1999 (Month/Day/Year Filed)	☒ Yes	☐ No
(Number)	(Country)	(Month/Day/Year Filed)	☐ Yes	☐ No
(Number)	(Country)	(Month/Day/Year Filed)	☐ Yes	☐ No
(Number)	(Country)	(Month/Day/Year Filed)	☐ Yes	☐ No

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional applications(s) listed below.

Insert Provisional Application(s): (if any)

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

All Foreign Applications, if any, for any Patent or Inventor's Certificate Filed More than 12 Months (6 Months for Designs) Prior to the Filing Date of This Application:

Insert Requested Information: (if appropriate)

Country	Application Number	Date of Filing (Month/Day/Year)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States and/or PCT application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States and/or PCT application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to the patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Insert Prior U.S. Application(s): (if any)

(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)
(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby appoint the following attorneys to prosecute this application and/or an international application based on this application and to transact all business in the Patent and Trademark Office connected therewith and in connection with the resulting patent based on instructions received from the entity who first sent the application papers to the attorneys identified below, unless the inventor(s) or assignee provides said attorneys with a written notice to the contrary:

Raymond C. Stewart	(Reg. No. 21,066)	Terrell C. Birch	(Reg. No. 19,382)
Joseph A. Kolasch	(Reg. No. 22,463)	James M. Slattery	(Reg. No. 28,380)
Bernard L. Sweeney	(Reg. No. 24,448)	Michael K. Mutter	(Reg. No. 29,680)
Charles Gorenstein	(Reg. No. 29,271)	Gerald M. Murphy, Jr.	(Reg. No. 28,977)
Leonard R. Svensson	(Reg. No. 30,330)	Terry L. Clark	(Reg. No. 32,644)
Andrew D. Meikle	(Reg. No. 32,868)	Marc S. Weiner	(Reg. No. 32,181)
Joe McKinney Muncy	(Reg. No. 32,334)	Donald J. Daley	(Reg. No. 34,313)
John W. Bailey	(Reg. No. 32,881)	John A. Castellano	(Reg. No. 35,094)

Send Correspondence to:

BIRCH, STEWART, KOLASCH & BIRCH, LLP
P.O. Box 747 • Falls Church, Virginia 22040-0747 or Customer No. 2292
Telephone: (703) 205-8000 • Facsimile: (703) 205-8050

PLEASE NOTE: YOU MUST COMPLETE THE FOLLOWING: ↓

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of First or Sole Inventor: Insert Name of Inventor →
Insert Date This Document is Signed
Insert Residence
Insert Citizenship →
Insert Post Office Address →

GIVEN NAME/FAMILY NAME	INVENTOR'S SIGNATURE	DATE*
Keita WATANABE	K. WATANABE	MAY. 17. 2000
Residence (City, State & Country)		CITIZENSHIP
Fujiyoshida-shi, Yamanashi-ken, Japan		Japan
POST OFFICE ADDRESS (Complete Street Address including City, State & Country)		
c/o Citizen Electronics Co., Ltd. 1-23-1, Kamikurechi, Fujiyoshida-shi, Yamanashi-ken, Japan		

Full Name of Second Inventor, if any: see above

GIVEN NAME/FAMILY NAME	INVENTOR'S SIGNATURE	DATE*
Residence (City, State & Country)		CITIZENSHIP
POST OFFICE ADDRESS (Complete Street Address including City, State & Country)		

Full Name of Third Inventor, if any: see above

GIVEN NAME/FAMILY NAME	INVENTOR'S SIGNATURE	DATE*
Residence (City, State & Country)		CITIZENSHIP
POST OFFICE ADDRESS (Complete Street Address including City, State & Country)		

Full Name of Fourth Inventor, if any: see above

GIVEN NAME/FAMILY NAME	INVENTOR'S SIGNATURE	DATE*
Residence (City, State & Country)		CITIZENSHIP
POST OFFICE ADDRESS (Complete Street Address including City, State & Country)		

Full Name of Fifth Inventor, if any: see above

GIVEN NAME/FAMILY NAME	INVENTOR'S SIGNATURE	DATE*
Residence (City, State & Country)		CITIZENSHIP
POST OFFICE ADDRESS (Complete Street Address including City, State & Country)		

*DATE OF SIGNATURE